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Informality, property rights, and poverty in China's "favelas"

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Summary. — In this study of households living in informal settlements in three principal Chinese cities, we analyze the associations between informality, property rights, and poverty. We propose that informality can be understood in terms of property rights (presence/absence, strength, completeness, and ambiguity). Drawing on the property rights (entitlements) theories of Sen, de Soto, Ostrom, Alchian, and Coase, we refine a list of property rights effects that can be tested empirically. Using a household questionnaire survey of 1,208 respondents from a representative sample of 60 urban villages in Beijing, Shanghai, and Guangzhou, we use robust regression models to detect statistical relationships between household performance on six poverty domains as a function of four property rights domains, controlling for income, human capital, and other influences. We find evidence for what we call Sen effects and de Soto effects. Our models show that some property rights are associated with lower poverty indicators. But we also find evidence to show that the absence, weakness, or ambiguity of property rights also reduce poverty indicators on particular domains, through what we assume to be a substitution effect. Informal settlements permit poorer household to live at lower costs than is usually, or officially, acceptable, and thus spend more on other welfare-enhancing expenditures. The distribution of property rights determines the size, distribution, and impacts of these trade-offs and shapes the economic and social performance of informal settlements.

Key words — *chengzhongcun*, slums, urban poverty, Sen, de Soto, property rights

1. INTRODUCTION

Informality is a widely used and contested notion used to characterize large parts of the housing sector in developing countries (Gilbert, 2002; Roy, 2011). The intensive study of informal settlements in the second half of the twentieth century has yielded a variety of explanations, definitions, and conceptualizations (Bhalla, 1990; Davis, 2006; De Soto, 2000; Harris & Todaro, 1970; Mangin, 1967; Mullan, Grosjean, & Kontoleon, 2011 and many others). Much of the discussion revolves around land tenure, poverty, self-organization, government interventions, migration, income disparity, informal economy, infrastructure, and governance issues. Most commentators would regard informal urban neighborhoods as a solution for the low-incomed, especially recent migrants, but also a problem for many modernizing municipal governments. They arise and are distinguishable from other types of neighborhood through processes of land development that lie to various degrees outside of legal land conversion, development, and building processes. Because of the lack of laws governing their subdivision, construction, maintenance, and governance, they are often viewed as slums. They are endured and even encouraged by governments because land conversion within formal legal frameworks renders housing unaffordable to large swaths of urban populations in developing countries. Formalizing or at least stabilizing tenure, infrastructure, and services are emphasized in normative studies.

The applicability of the concept of informal settlements to China has been debated because of the absence of squatter communities in that country (Wu, Zhang, & Webster, 2013). It is clear, however, that China does have an informal housing sector in its so-called *chengzhongcun*, or 'villages in the city' (urban villages for short) (Tian, 2008; Zhang & Zhao, 2003). Since housing in these quarters is either owner-occupied or rental, formal land tenure categories cannot alone be used to define and study housing market informality. Chengzhongcun are not squatter settlements in the normal use of the term. There are features of them, however, such as their densification, which *are* illegal or partially legal. It is development rights, or air-rights above a legally owned plot of housing land that, if anything, can be described as being squatted (i.e., appropriated and occupied without legal authorization). The unique proprietary condition of China's "favelas" demands innovation in the way informality is defined and measured (Zhao & Webster, 2011).

To probe the meaning and consequences of informality in China's contemporary informal settlements we combine insights from several, typically unrelated, behavioral theories of property rights, notably: Armen Alchian's economic theory of property rights (1965); Amartya Sen's notion of entitlement failure (1981, 1997); Hernando de Soto's propositions about the economic deepening effects of property rights security (2000); Eleanor Ostrom's theory of collective rights (1990); and Ronald Coase's transaction costs theory of property rights (1937, 1960). We select these theoretical ideas because they have proven to be powerful and influential in investigating a wide range of political-economic issues (three of the authors are Nobel laureates). Each provides an analytical framework that gives a particular insight into the impact of laws on resource allocation. This is precisely what is needed in understanding the origins, dynamics, and impacts of informal settlements since, as we have noted, the latter are characterized by degrees of legality.

Amartya Sen (1981) tells us that the terms of trade between entitlements and food can lead to poverty, vulnerability, and starvation. By extension, a household's "entitlement-set" (set of entitlements or property rights) and its mapping to various essential urban resources (what those rights can be exchanged for) may lead to poverty, vulnerability, and "starvation" not

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only of food but of housing, education, health care, and so on. De Soto (2000) emphasizes the effects of formalized entitlements (or property rights – the two terms are used interchangeably in our paper) on poverty, vulnerability, and wealth creation; arguing that property rights make resources tradable, including the conversion of land into credit, and that ownership prevents leakage of returns from investment and thus increases petty entrepreneurship and productive upgrading of assets. Ostrom (1990) tells us that formal property rights are not necessary to achieve social order in respect of scarce co-consumed goods; common property can be effectively brought into productive use if the right cultural and institutional conditions exist. Alchian (1965) tells us that entitlements are held by degrees, which is not an insight formally incorporated into de Soto's, Sen's or Ostrom's analyses, nor generally used in derivative studies. Coase (1960) suggests that the distribution of property rights determines the economic outcome of a resource allocation problem and that transaction costs determine the supply and distribution of property rights.

Bringing these ideas together, we propose in this paper to define and measure "informality" by a property rights profile that includes absolute and degrees of entitlements. We use this household "informality profile" to help explain income, food, and housing poverty among a pseudo random sample of 1,208 households living in "urban villages" in three first-tier Chinese cities. We believe that this is the first time these ideas have been brought together in this way, both theoretically and empirically. This theoretical and empirical innovation, we suggest, is particularly useful for understanding the dynamics of informal settlements in China; but it may also help unlock new insights elsewhere. This may especially be so where property rights are complex, dynamic, and evolving at the interface of spontaneous action and government action, as is often the case in squatter-led urbanization that has matured and co-evolved with the formally planned system, such as in large parts of Istanbul for example.

One of our main objectives in the paper is to test and further develop a theory of informality based on Chinese data but applicable elsewhere. Our basic proposition is that informality can be empirically and theoretically defined in terms of the absence/presence and strength or degree of property rights. This, we offer as a theoretical development in the scholarship of informal settlements.

Our empirical analysis both illustrates the proposition and tests its explanatory power by measuring the systematic impact of household property rights (informality) profiles on household poverty.

Interpretation of the empirical results then takes the theoretical agenda a step further by making explicit connections to the "big-picture" political science theories summarized above. We illustrate how those theories can give further nuanced insights into the empirical models developed on the basis of the starting proposition that informality can be defined empirically by enumerating a detailed list of property rights on several poverty-relevant domains.

The rest of the paper is structured as follows. Section 2 considers what informality means in the context of migrant-worker housing in Chinese cities. Section 3 probes the idea of informality using a variety of property rights concepts and introduces a set of propositions linking property rights, informality, and poverty. Section 4 sets out the method used in our empirical study of urban villages, including a description of six poverty indicators in four interrelated domains (income, savings, food, and housing poverty) and a set of property rights indicators under four categories (household registration, social-security, employment, and housing rights) that, we hypothesize, influence poverty measures. Section 5 presents the results from a set of robust regression models, which estimate the effects of these entitlements on the poverty indicators. Section 6 is a discussion that links these results to property rights propositions in Section 3; and Section 7 concludes.

2. CHINA'S "INFORMAL SETTLEMENTS

The existence, status, and function of modern Chinese "slums" have been ambiguous during the 30 years of China's post-reform urbanization era. For a long time, urban poverty was not officially recognized (Gustafsson & Li, 2004; Ravallion & Chen, 2007); the emphasis being placed on the staggering reduction of rural poverty through labor and land market reforms and the associated shift of underproductive rural workers to productive (but low-pay) urban jobs (Appleton & Song, 2007). More recently however, governments have acknowledged the existence and scale of urban poverty (Wang, 2004) and attention has been drawn to the urban neighborhoods accommodating the urban poor: principally, former work unit block housing; residual pre-1949 streets left un-redeveloped through the centrally planned era; and the *chengzhongcun*, (urban villages) (Wu, 2004). On the face of it, the "slum" designation might well apply to the last two of these (Gilbert, 2007), since it is in these neighborhoods that housing and urban facility poverty seems to coincide with income poverty and vulnerability (Wu, He, & Webster, 2010). The vast majority on an urban low income now live in urban villages across China, with the numbers being greater in the cities of the south. Urban villages clearly perform some kind of equivalent role to the informal settlements of other rapidly developing countries (Perlman, 2010) in that they comprise, in a large part, informally or semi-formally built low-cost homes inhabited by rural–urban migrants.

But there are two significant differences compared to the informal settlements typical of other developing countries. The first is that these are not squatter settlements. They are a unique style of private rental provision (Kung, 2000; Tian, 2008; Wang, Wang, & Wu, 2009; Zhu, 2002). The second is that they are formed under a unique land tenure and set of collective ownership institutions: collectively owned village land governed by a village collective administration typically incorporated as a joint stock company (Wang *et al.*, 2009).

This means that the *informality* in China's informal settlements does not principally mean lack of regularized (legally binding) tenure. The majority of the urban poor have signed a rental contract with their landlord. Rather, the informality is created by a blend of institutions from the collective and post-collective era co-evolving in parallel (Zhao & Webster, 2011; Woo & Webster, 2014) for a formal discussion of co-evolution of private and collective urban institutions). China's informal settlements are a particular legacy of the "one-country–two-systems" reformist policy of Deng Xiaoping. And because of the pragmatism of that policy, especially in the Southern coastal cities where it combines with powerful clan-based local politics (Tian, 2008), China's "favelas" are as much a part of the DNA of its sprawling cities as are Rio's (Perlman, 2010).

We ask, in this paper, how the complicated bundle of property rights conferred on urban village dwellers by multiple institutions before and during China's economic transformation affects their income, savings, food, and housing poverty status.

Rights conferred upon owner-occupiers and tenants of China's urban village buildings vary on several important

dimensions, including whether or not they are conferred by law; the type of law by which they are established and sanctioned; the effectiveness of sanctions; and the strength of the right regardless of whether it is established by law or by individual or group force. It will be clear from this analytical statement that we are using a definition of property rights that goes beyond the merely legalistic definition. In this we follow the tradition of the Law and Economics literature (Barzel, 1989), which recognises that rights over property can effectively be established by law or by force; and in the case of the former, by formal (state-backed) or informal rules. A legal right may be no right at all if the law is ill-designed and has no teeth. On the other hand, as Ostrom has shown in numerous rural situations (1990), traditional rights not backed by formal laws may be highly effective in governing contested resources.

This view of property rights is also accompanied by a more profound insight (and critique of legalistic conceptions of property rights): that because of the transaction costs of making and enforcing contracts and laws, no property right, whether established by government decree, judge, village committee or cultural convention, is ever complete (Hart & Moore, 1990). There are always degrees of freedom and ambiguities in any property rights assignment, however established; even in the most advanced rule-of-law-following society. In a transitional society like China, the degrees of freedom are very wide. So an analytical framework that recognises *de facto* as well as *de jure* rights and talks in terms of *degrees of rights* is potentially more useful than a purely legalistic and binary definition (which accounts for the massive interest in the field of Law and Economics across the legal and social sciences). For obvious reasons, this approach has great potential in studies of informal settlements, where the focus is precisely on ambiguity and on the economic and social significance of rights ambiguity for the behavior of low-income residents, land-owners, governments, and other stake-holders.

The empirical models in this paper look for associations between movement on selected poverty dimensions and a variety of entitlements or property rights variables, some of which are clearly established by law and others of which are more graded.

3. ENTITLEMENT PROPOSITIONS ABOUT CHINA'S URBAN VILLAGES

Amartya Sen's entitlement theory of poverty and starvation (1981) offers a novel framework for exploring the dynamics of informal settlements. Its seminal insight into the cause of famines was that people can starve not only because of a shortage of food stock but because of drastic changes in the terms of trade between food and a household's various resource entitlements (entitlement mappings).

We propose that the essential idea can be readily extended to other kinds of *starvation*. In the context of urban poverty, poor households may face unfavorable terms of trade between their labor and the various resources necessary for personal survival and social reproduction in the city (which are different to rural survival and social reproduction requirements). There are many studies showing that migrants sometimes work in Chinese cities at the expense of education and health service consumption (Solinger, 2006). In the Chinese context, they cannot, however, easily choose to forgo permanent shelter as the urban poor can in most other countries, since homelessness and street living is outlawed in China. But they can forgo health-care for non-life-threatening conditions and forego adequate education for their children. *Healthcare and educational starvation* can be said, in Sen's terms, to be a condition of sections of China's urban poor (He, Liu, Wu, & Webster, 2010; He, Wu, Webster, & Liu, 2010).

However, informal settlements have a positive effect on the condition of the urban poor from another reading of Sen's poverty theory: they are sources of low-cost housing, provided at conditions typically below those thought acceptable by governments (Wang *et al.*, 2009; Wu *et al.*, 2013), and thus improve the entitlement mappings of those with few resources and lessen the incidence of "housing starvation" (homelessness). This is achieved at the cost of poorer housing conditions: giving rise to slums or "housing poverty" short of starvation.

Two of the main criticisms of Sen's original entitlement model were that it assumes (a) a static view of entitlements and (b) a single economic institution determining entitlement mappings (perfect commodity markets). In contrast to this simple abstraction, the ability of residents in China's urban villages to avoid or cope with poverty is determined by a mixture of state-endowed, collective organization-endowed, individually acquired, and market-purchased entitlements. The institutions that facilitate the conversion (mapping) of one right onto another are many-fold, including for example, municipal, district, and street-office state welfare and urban service agencies; village collectives; village joint-stock companies; and informal and formal labor, housing, capital, health, and education markets. A household therefore has a complex set of endowments, the exchange value of which depends among other things on the strength and completeness of the various rights endowed.

So, for example, the owner of a shared-equity self-built house in the city of Guangzhou, might own the first two floors and therefore have full legal rights under China's planning and compensation laws. The owner of one of the building's upper floors, owned under what is referred to as "small property rights", has a weaker legal right since upper floors are deemed illegal. This does not mean to say, however, that on demolition, the upper floor owner receives no compensation: compensation laws have moved in favor of villagers over the years and illegal building owners now receive at least the building costs in compensation (making illegal building a capital-neutral investment yielding high rental returns), and sometimes more (Zhao & Webster, 2011). In addition, the two co-owners may have signed an agreement protected by contract law, giving them *pro rata* shares in the building regardless of the exact legal status of their part of the property. If this agreement is not in place, the effective allocation of property rights may be decided by local judgement in the village organization or by force. All this means that security of land tenure, as with security of any other endowment, is in reality, held with a degree of probability. Property rights in China's urban villages are held in degrees, not in absolute terms. The degree of a right held in respect of any particular endowment is partly a function, as we have said, of the degree of completeness of the agreements or contracts used to secure the right. In the empirical analysis reported in this paper, we investigate, among other things, the impact of degrees of rights on various poverty indicators. For example, we ask whether the degree of formality in home-rental contracts (written, oral, no contract) is associated with various poverty indicators; and similar with labor contracts.

This brings us to Hernando de Soto. Property rights have an impact on poverty and economic underdevelopment in at least three distinct ways in de Soto's and associated arguments (De Soto, 2000). First, a lack of landed property inhibits engagement with the formal sector, principally, but not solely by

making squatters and informal renters ineligible for secured credit. Second, the lack of property is a behavioral disincentive to invest. A street trader is more likely to upgrade to a bicycle cart from a handcart if she has a secure place to store it. Ownership of a bicycle cart makes it more likely that the trader will invest in the search costs of discovering places undersupplied with her trade. The longer and more secure a lease on a home, the more likely a migrant is to invest in loyalty at the work place and in social networking that might yield better employment opportunities. The more secure a labor contract, the more likely it is that a worker will invest in training or other forms of self-improvement and in more suitable clothes and better equipment, all of which may make him more efficient and employable. Third, and generalizing the first point, resources protected by private property rights are more easily exchanged and may thus more easily move from a less efficient to more efficient use. In Chinese urban villages, making landed property rights private, clear, and alienable (they are currently collective, ambiguous, and inalienable under national law) is likely to increase the productivity of village land. Land value in urban villages is lower because crowding resulting from villagers maximising density on their inalienable plots of village land by building cheaply upward and outward to the boundaries of neighboring plots, has the effect of lowering the value of the entire development project. Land rent is dissipated through poor-quality, overcrowded environments.

Introducing a Coasian strand of property rights theory into the discussion, we hypothesize that there is a natural pressure for the informal rights in Chinese urban villages to be clarified and strengthened; in the extreme, converted into private rights. The pressure to clarify rights comes from transaction costs. If the costs of transacting are too high as a result of non-existent, poorly sanctioned, or ambiguous property rights, then existing rights will fragment and strengthen and new rights be established to reduce these costs and facilitate smoother economic and social interaction and wealth creation. Coasian theory goes further to predict that if the costs of subdividing common rights to private rights is lower than the value thus created, then rights are likely to subdivide. In the informal settlements of the world, rights over land, labor, and capital are constantly subdividing as informal land, labor, and capital markets mature and formalize (Webster & Lai, 2003).

We thus characterize an entitlement theory of informality that supports and is shaped by various theoretical arguments of pertinence to the study of informal housing areas. Some of these reinforce each other, others work in opposite directions. For example, one argument emphasizes the *positive* effect of neighborhoods with limited and ambiguous property rights and the toleration of "slum"-conditions. This might be thought of as a "Sen entitlement-mapping substitution effect" of property rights on poverty ("Sen effect" for convenience). Ambiguous rights that have the effect of reducing housing price thereby increase the bundle of goods a household can purchase with a given set of endowments. Contrast this with the argument for the *negative* effect of limited and ambiguous property rights and for the strengthening and clarifying of property rights over the resources needed for urban survival and reproduction, which may be thought of as a "de Soto effect" of property rights on poverty.

The opposition of these two emphases is illustrative of a wide range of behavioral propositions about the effects of property rights on informality, poverty, and wealth creation that are not so easily mapped to formal theories. A non-exhaustive typology of poverty effects of entitlements includes the following (PRE = Property Rights Effects):

PRE1: A property right raises a household's entitlement mapping and can raise its real income.
PRE2: A right to a minimum standard of consumption in one sector (particularly via regulation) can raise the cost of urban living and increase poverty on other dimensions.
PRE3: Conversely, absence of a right to minimum standards (of any resource, including housing, education, health care, and so on) can lower household expenditure on that resource and reduce poverty on other dimensions.
PRE4: A property right can induce a household to invest in the property/resource over which that right is held, since the right prevents the benefits of investment from leaking away. Extending this: the longer term and the stronger the property right, the greater the investment effect.
PRE5: A property right can give collateral social benefits, such as greater social inclusion as a result of acquiring property-owning status.
PRE6: A property right can give collateral economic benefits, such as greater chance of being hired as a result of having an acceptable address or having access to a morning shower.
PRE7: A property right can give collateral financial benefits such as access to collateralized bank loans.
PRE8: A property right means that a resource is more likely to be traded in pursuit of mutual gains from trade and thereby move from less productive to more productive uses and owners, benefitting both the individual and wider economy and society. This accounts for PRE7, since the rights to unambiguously owned land or other assets can be subdivided and the right to alienation sold off temporarily to a bank in exchange for borrowed capital (collateralized credit).
PRE9: Property rights and the organizations that create and govern them will tend to evolve over time in response to the costs of transacting scarce resources. Rights over the many informally shared resources found in informal settlements will, over time, tend to fragment and formalize in order to reduce the costs of economic and social transactions. This will, in the aggregate, tend to decrease poverty for those capturing the rights.
PRE10: Notwithstanding PRE9, a collective property right can have the effect of giving households poverty-reducing access to shared-consumption goods and services. This effect can be seen at an early stage of an informal settlement (prior to PRE9) and also in parallel to PRE9 with respect to residual land and other assets that for whatever reason resist privatization.

To caricature: PRE 1–3 can be designated *Sen effects*; PRE 4–8 *de Soto effects*; PRE 8 and 9 *Coasian effects*; and PRE10 an *Ostrom effect*. Of course these various theoretical emphases in the study of entitlements, informality, and poverty are all interlinked and some are overlapping. In the discussion of our empirical models we use the above typology to characterize various property rights – poverty associations uncovered in our sample of inhabitants of China's informal settlements.

4. METHOD

We empirically test associations between poverty and types and degrees of property rights in a sample of informal migrant villages in three Chinese cities, after statistical adjustments for household head and household profiles, household production function variables, and indicators of social cohesion. The study is based on cross-sectional data drawn from the Urban Living Conditions Survey, 2010 (ULCS) conducted across

Beijing, Shanghai, and Guangzhou. The morphology of urban villages is quite distinct in each of these cities. In Guangzhou they have clear village boundaries and comprise tightly packed multi-floor buildings of modern rental apartments. Shanghai is more underdeveloped in terms of housing. The remaining residual villages in Shanghai retain some rural characteristics but with intense internal subdivisions. For Beijing, besides the remaining village buildings, there are purpose-built compounds within urban villages, developed by small family builders.

A complete list of urban villages was obtained from each city's municipal government office. From each list, 20 villages were selected according to the principle of probability proportion to size (PPS), which is a standard Chinese official sampling method. From each village, 20 households were systematically selected through a random start address with fixed intervals. This address-based approach is widely used in Chinese household surveys to capture rural migrants because there is no official list for migrants. In this way, a set of twenty statistically representative migrant villages was chosen from each of the three cities and a pseudo-random sample of 1,200 households constructed plus 5% extra to allow for dropout. 1,208 valid questionnaires were obtained, giving an approximately 95% response rate, achieved through a strict and well-practiced method of interview. The sample of representative residents sharing analogous social, environmental, and institutional settings in the three cities was administered a survey comprising 229 questions based on Likert scales, continuous and dichotomous variables. These were designed to capture individual respondent's socio-demographics, poverty status as well as indicators of the degree of command over various property rights bundles. The questions were categorized into five components: basic situation of household members; family income and expenditure; living conditions; employment status of the head of household; and community neighborhood conditions.

As far as we are aware, this is the first attempt to report representative profiles of Chinese urban village dwellers at a city or multiple city scale. The household profiles will be of interest to researchers investigating specific villages and will allow them to place their case study households within the wider population of urban village households from which their case study is drawn.

The study employs six indicators of poverty as dependent variables: measures of income, household food consumption, savings, degree of dwelling-level over-crowding, access to basic household amenities, and housing expenditure to total expenditure ratio.

The first three are expressed respectively as the natural logarithm of per-capita household income, household food expenditure and savings. Over-crowding is measured as the natural logarithm of per-capita dwelling area for each household. An index of household amenities is computed for each household to assess the degree of access to eight basic amenities: separate kitchen, separate toilet, shower facilities, liquefied gas, gas pipeline, air conditioning, heating/heating equipment, and internet. The index ranges from zero to one, with zero representing absolute deprivation of household amenities and being synonymous with highly informal settlements; and a value of one, indicating absence of deprivation. Housing expenditure ratio is calculated as a household's ratio of expenditure incurred on housing to total household expenditure.

We do not attempt to categorize households as poor or not poor, or to estimate their vulnerability to poverty. The idea is to measure how the six selected dimensions of poverty move independently with patterns of entitlements (rights over various types of welfare-enhancing resources). This models the movement of the multi-dimensional "corners" or axes of a Sen-theoretic entitlement-mapping hyperplane (conceptually, a multi-dimensional budget curve).

Individual and household production functions comprise socio-demographic measures for the head of household and for the household as a whole, including household registration status, gender, number of dependants, level of educational attainment and an index of social cohesion; the latter two being the human capital component of the household production function. The importance of lack of social capital in exacerbating poverty and poverty traps in an informal economy has long been underscored. Educational attainment is modeled as a five-factor variable (none/primary school, junior high school, senior middle school, technical secondary school, col lege/undergraduate/postgraduate) with the second category acting as a reference.

Social cohesion acts as an intangible asset in an informal economy, enabling residents to function cooperatively and take collective action to pool together scarce resources and to try to secure claims to property rights. This has been statistically controlled for in our models through an index of social cohesion, a 12-component indicator of a respondent's perception of community social cohesion.

Household registration (*hukou*) comprises four categories: city non-agricultural household, city agricultural household, rural non-agricultural household, and rural agricultural household. For simplicity, it has been recoded as a three-factor variable; city household, rural agricultural, and rural non-agricultural household. *Hukou* is a legacy institution from the centrally planned era conferring various social welfare and labor market access entitlements to those registered within a territorial jurisdiction.

Beyond the *hukou* entitlement, we test the relationship between poverty and the presence and degree of entitlements by employing three types of entitlement bundle: property rights pertaining to social security, employment, and housing.

The social security entitlement bundle has been operationalized as a presence or absence of old-age insurance, medical insurance, unemployment insurance, work injury insurance, and other social insurance.

Property rights with respect to employment are parameterized in terms of labor contract type and employment stability. Labor contract type is coded as a five-factor variable namely, self-employed & business owner, permanent & long-term contract ($\geqslant$3 years), short-term contract (0–3 years), temporary (no contract), and others, with the first acting as a reference category. Employment stability is coded as a four-factor variable namely, highly stable with no change in employment over the past 3 years, moderately stable (up to one change), unstable (up to three changes) and very unstable (greater than three changes) with the first acting as a reference category.

Property rights with respect to housing are expressed in terms of tenancy type, tenancy contract type, residential stability, presence of landed property right, and the degree of transition in property rights. Tenancy type indicates the title of housing property right and is coded as a four-factor variable including tenancy of village self-built units, urban residential private units (built by villagers and sold to outsiders illegally under a so-called "small property rights"), village collective construction, and public housing units/workers' collective dormitory/others with the first acting as a reference category. Tenancy contract type is employed in the models as an indicator of the strength of property rights and comprises three factors; written contract, oral contract, and no contract.

Residential stability is measured as a duration of stay of a household and acts as a proxy for the intangible *de facto* rights to urban public goods that a respondent commands with increasing duration of stay. It is measured as a four-factor variable; 0–2 years, 3–5 years, 6–10 years and greater than 10 years of stay with the first category acting as the reference. The importance of landed property rights is underscored in our models with the help of a two-factor variable: owner of a residence in hometown and non-owner. The strength of locational entitlements is measured in terms of two additional variables. Probability of demolition is assessed in terms of the prevailing perception of residents regarding the anticipated future demolition of their neighborhood. Land acquisition is modeled as a two-level factor (no loss of farm land/ partial or complete loss of farm land) and acts as a surrogate for new entitlements gained via compensation as well as for the poverty-inducing effects of land dispossession (effects working in opposite directions on poverty).

The relationships between these multiple categories of entitlements and the six indicators of poverty were examined. As the indicators of poverty and housing informality all have a non-normal distribution, a non-parametric Kruskal–Wallis test was employed to examine the level of statistical significance of the differences of means across categories. A series of linear regression models were run for each of the poverty indicators and the associations with entitlements studied. A robust regression technique was employed to account for non-normality and adjustments for the pull of the outliers in the data. Beta (standard error), 95% confidence intervals, and the level of statistical significance (α) at $p < 0.05$ and $p < 0.10$ are reported. All statistical analyses were conducted using the statistical software package Stata 11.2 (StataCorp, College Station, TX).

5. RESULTS

Table 1 presents descriptive statistics of the outcome variables and key profiles of household heads for the three cities of Beijing, Shanghai, and Guangzhou. In general, predictors of poverty of study participants residing in the urban villages differed significantly, with Shanghai consistently positioning itself at the higher end of the spectrum (being least prosperous with respect to most of the six predictors) followed by Beijing, while Guangzhou was at the opposite extreme. Mean per-capita monthly income in Yuan varied between 2,132 (S.D. = 1182) in Shanghai, 2,383 (S.D. = 1978) in Beijing, and 3,716 (S.D. = 11,996) in Guangzhou. 74% of the survey participants reported an income higher than the cut-off poverty line of 400 Yuan/month (indicating the basic sustenance level). Average monthly food expenses and savings in Yuan for Shanghai, Beijing, and Guangzhou are 648 and 1,004; 820 and 400; and 1,183 and 1,148 respectively. Mean per-capita dwelling area in Shanghai, Beijing, and Guangzhou is 4.26, 11.6, and 24.9 square metres respectively while the mean household amenities index is 0.12, 0.27, and 0.54, respectively. The housing expenditure ratios reported are 0.13, 0.20, and 0.19, respectively. Table 2 presents the mean and standard deviation of the outcome variables across categories of property rights and entitlements and the results of a Kruskal–Wallis test reporting the significance of the difference of means across categories.

Table 1. *Descriptive statistics of the indicators of poverty/informality and key household profile*

Predictors	Mean (S.D.)			*p*-Value of difference
	Beijing	Shanghai	Guangzhou	
Per-capita income (Yuan/Month)	2383.1 (1978)	2132.1 (1182)	3716.2 (11,996)	0.33
Household Food Expenditure (Yuan/Month)	820.0 (558)	648.1 (418)	1182.7 (2487)	<0.01
Household savings (Yuan/Month)	400.2 (982)	1003.5 (1549)	1148.2 (3118)	<0.01
Per-capita dwelling area (m^2)	11.6 (21)	4.26 (2)	24.9 (33)	<0.01
Index of household amenities[†]	0.27 (0.23)	0.12 (0.10)	0.54 (0.18)	<0.01
Housing expenditure ratio[‡]	0.20 (0.21)	0.13 (0.10)	0.20 (0.18)	<0.01
Household profile				
Gender (Female), %	12.95	18.92	14.13	
Number of dependants, range	1–6	1–6	1–6	
Educational attainment, %				<0.01
None/primary school	10.00	18.46	17.10	
Junior high school	36.79	40.00	38.66	
Senior middle school	31.43	28.46	27.88	
Technical secondary school	5.71	5.77	7.06	
College/undergraduate/postgraduate	16.07	7.31	9.29	
Index of social cohesion[*]	0.59 (0.13)	0.61 (0.10)	0.60 (0.12)	0.07

[†] The *Index of household amenities* is an eight component additive index comprising of indicators of household amenities: separate kitchen, separate toilet, shower facilities, liquefied gas, gas pipeline, air conditioning, heating/heating equipment, and internet. Each amenity (A_i) has been coded as 1 if present and 0 in case absent. The overall index has been enumerated as $\sum A_i/8$.

[‡] The *Housing expenditure ratio* was enumerated as the ratio of expenditure incurred in housing (including utilities and housing maintenance) to the total household expenditure.

[*] The *Index of social cohesion* is a 12-component additive index comprising of components of respondent's perception of social capital in the community. The 12 components comprised questionnaires related to perceptions of: friendliness of community members, similarity of value and lifestyle, propensity to attain help from neighbors, know many of the community, known by neighbors, sense of belonging to the place, care of neighbor's perception, participation in public events, community problem solving, importance of community membership, care for each other, and long-term wish to continue living in the same community. They were coded across five categories (5 = strongly agree 4 = agree 3 = neutral 2 = disagree 1 = strongly disagree) and the overall index has been enumerated as $\sum SC_i/60$.

(a) *Associations of income, household food expenditure, and savings poverty indicators with entitlements*

The results of the Kruskal–Wallis test for the whole sample (the three cities combined) are given in Table 2. These indicate significant differences in income, food expenditure, and savings across the categories of most of the indicators of property rights/entitlements. The mean per capita income varies significantly according to household registration; being highest in rural non-agricultural households and least among the city households in urban villages. However, household food expenditure and savings are not significantly different across the three household registration categories. Per-capita income differs significantly between those with and without social security entitlements in the form of old-age insurance, medical insurance, unemployment insurance, and work injury insurance. Food expenditure varies significantly between those with and without medical insurance, while savings varies significantly across the two categories of work injury insurance. Per-capita income differs significantly across employment contract type, being higher among those having a permanent/long-term contract than those with short-term and temporary contracts. Household food expenditure varies significantly across categories of labor contract type; however, differences in household savings are not significant. Differences in per-capita income, household food expenditure, and savings are not significant across categories of employment stability. Significant differences in per-capita income and savings are reported with respect to the tenancy tenure type, with dwellers of urban private residential units having the greatest income and savings, while those living in village collective constructions earn and save the least. Per-capita income varies significantly with tenancy contract type, with owners of written contracts earning more than those with no contract and oral contract. Household food expenditure and savings also exhibit significant differences across tenancy contract type with holders of permanent contracts spending and saving more, followed by oral contract holders and then "no contract". Per-capita income and savings are not significantly different across categories of residential stability, while household food expenditure does vary, being greatest in residential households with the duration of stay in excess of 10 years. Significant differences in mean per-capita income are found between respondents owning property in their town/village of *hukou* registration and those not, with the former having higher per-capita income. Finally, household food expenditure and savings vary significantly between those who anticipate demolition of their urban neighborhood and those who do not. Residents who have partially or completely lost arable land have higher mean food expenditure than those who have not lost any land or property to redevelopment requisition.

Table 3 presents the results of a robust regression analysis of these data, indicating associations between income, food consumption, and savings poverty measure and the various property rights/entitlements predictors, controlling for human capital and other household production function components. "City" is coded as a dummy variable to detect the significance of being located in Shanghai, Beijing, or Guangzhou (city effect) compared to other effects.

Controlling for household profiles and property rights/entitlement bundles, survey participants residing in Shanghai had significantly higher per capita income and savings ($\beta = 0.164$ and $\beta = 0.281$ respectively, $p < 0.05$), but lower per capita food expenditures ($\beta = -0.061$, $p < 0.05$), with Beijing being the reference category. Guangzhou had comparatively higher per capita income, food expenditure, and savings but the differences compared to Beijing were not significant. This is an intriguing result worthy of further study: holding household profile constant, including household size, social capital, and so on; and holding entitlements constant (hukou, tenancy, labor contract type and so on), there is a positive area-effect (higher per capita income and savings and lower food costs) on urban village residents in shanghai compared to those in Beijing. These are likely to be a result both of differences in the labor markets of the two cities and differences in the typical locations of urban villages in the two cities (which would influence, for example, wage levels, gross and net revenues of small businesses, and food prices).

With reference to rural-agricultural *hukou* households, rural non-agricultural *hukou* households tend to earn significantly greater per-capita income ($\beta = 0.137$, $p < 0.05$), controlling for the confounding factors listed. Household food expenditure and savings are both positively associated with per-capita income ($\beta = 0.157$ and $\beta = 0.447$ respectively, $p < 0.05$). Greater per-capita income is associated with higher educational attainment, being significant for respondents who went to senior middle school and college ($\beta = 0.123$ and $\beta = 0.321$ respectively, $p < 0.05$). However, household food expenditure and savings are not significantly associated with education. Among the social entitlements, those with medical insurance had significantly higher per-capita income ($\beta = 0.150$, $p < 0.05$) and lower savings ($\beta = -0.096$, $p < 0.05$) in reference to those without. Similarly, those with "other social insurance" tended to spend significantly more on food ($\beta = 0.077$, $p < 0.05$). Per-capita income was inversely associated with old age insurance ($\beta = -0.135$, $p < 0.10$), and household savings was inversely associated with medical and unemployment insurance ($\beta = -0.126$ and $\beta = -0.144$ respectively, $p < 0.10$).

The relationship between income and labor contract type indicates that compared to the self employed and business owner reference category, those with labor contracts falling under the category of short term, temporary, and others had comparatively lower per-capita income ($\beta = -0.124$, $\beta = -0.127$, and $\beta = -0.186$ respectively, $p < 0.05$). A systematic decreasing trend in income is observed as one moves across the categories associated with reduced employment contract security. Similarly, those with short-term labor contracts have significantly lower savings compared to self employed and business owners ($\beta = -0.084$, $p < 0.10$). In comparison to householders with highly stable jobs, those with unstable jobs have a lower income ($\beta = -0.151$, $p < 0.10$), while those with moderately stable jobs and very unstable jobs have significantly lower savings ($\beta = -0.088$ and $\beta = -211$ respectively, $p < 0.05$).

Among housing property rights, neither per-capita income nor household food expenditure is significantly associated with the tenancy tenure type. Compared to tenants of village self-built units, occupants of the urban residential private units have significantly higher savings ($\beta = 0.205$, $p < 0.05$), while those living in village collective construction have lower savings ($\beta = -0.240$, $p < 0.05$). Tenancy contract type is a significant predictor of all three indicators of poverty. With reference to residents with written tenancy contract, those with oral tenancy contracts and without any contract have significantly lower per-capita income ($\beta = -0.113$, and $\beta = -0.154$ respectively, $p < 0.05$) as well as household food expenditure ($\beta = -0.037$, $p < 0.10$ and $\beta = -0.060$, $p < 0.05$, respectively). Furthermore, with reference to residents with written tenancy contracts, those without any tenancy contract have higher household savings ($\beta = -0.175$, $p < 0.05$). Only household food expenditure varies significantly with degree of

Table 2. *Results of Kruskal–Wallis one-way ANOVA comparing the indicators of poverty/informality across the categories of property rights/entitlements*

Predictors	Percent	Per-capita income (Yuan/month)	Food expenditure (Yuan/month)	Savings (Yuan/month)	Per-capita dwelling area (m^2)	Index of household amenities	Housing expenditure ratio
		Mean (S.D.)					
Residence registration							
Rural agricultural household	77.5	2643.2 (7845)	866.5 (994)	842.9 (2298)	12.9 (23.5)	0.30 (0.24)	0.19 (0.19)
City household	4.7	2250.0 (1706)	652.7 (565)	428.2 (961)	24.3 (50.1)	0.42 (0.27)	0.13 (0.11)
Rural non-agricultural household	17.8	3247.3 (3346)	1154.2 (3135)	868.1 (1719)	14.7 (17.9)	0.35 (0.28)	0.17 (0.14)
p-Value of difference across categories		<0.001	0.121	0.515	0.002	0.012	0.175
Property right/entitlement bundle – Social security							
Old-age insurance (p^*-value of difference)	25.2	0.003	0.660	0.840	<0.001	0.001	0.003
Medical insurance (p^*-value of difference)	37.7	0.001	0.003	0.067	0.139	0.472	0.045
Unemployment insurance (*p*-value of difference)	6.7	<0.001	0.204	0.658	0.019	0.018	0.102
Work injury insurance (p^*-value of difference)	11.8	0.045	0.507	0.001	<0.001	<0.001	0.125
Other social insurance (p^*-value of difference)	9.2	0.109	0.063	0.667	0.003	<0.001	0.196
Property right/entitlement bundle – Employment							
Labor contract type							
Self-employed & business owner	37.7	2653.9 (4097)	1016.6 (1309)	1109.6 (3059)	12.5 (14.8)	0.37 (0.26)	0.25 (0.21)
Permanent & long-term ($\geqslant$3 years)	6.4	3394.5 (2293)	1679.3 (5065)	702.5 (1187)	14.5 (15.7)	0.40 (0.27)	0.12 (0.09)
Short-term (0–3 years)	24.2	3265.4 (13,023)	757.5 (472)	644.8 (1202)	11.9 (18.1)	0.28 (0.24)	0.13 (0.11)
Temporary (No contract)	22.7	2379.9 (2782)	729.7 (515)	525.3 (1199)	16.4 (40)	0.26 (0.22)	0.14 (0.14)
Others	9	2170.6 (1825)	725.7 (666.4)	860.9 (1342)	16.7 (23.4)	0.29 (0.26)	0.20 (0.21)
p^*-Value of difference across categories		0.002	<0.001	0.404	0.013	<0.001	0.000
Employment stability							
Highly stable (No change)	65.7	2766.6 (8330)	961.2 (1876)	881.4 (2316)	11.9 (23.4)	0.32 (0.25)	0.18 (0.17)
Moderately stable (1 change)	19.5	2592 (3569)	879.3 (682)	793.4 (1889)	16.5 (29.4)	0.31 (0.24)	0.21 (0.21)
Unstable (1 < changes $\leqslant$ 3)	8.3	2934.2 (4047)	735.8 (550)	408.8 (870)	13.6 (20.8)	0.29 (0.24)	0.17 (0.17)
Very unstable (>3 changes)	6.5	2757.2 (2689)	695 (463)	869.4 (2430)	22.2 (29.3)	0.33 (0.26)	0.16 (0.14)
p^*-Value of difference across categories		0.929	0.102	0.382	0.002	0.920	0.083
Property right/entitlement bundle – Housing							
Tenancy tenureship type							
Villages' self-built units	78.4	2648.2 (7576)	813.4 (562)	776 (2202)	12.6 (22.8)	0.30 (0.24)	0.19 (0.18)
Urban residential private units	11.9	3447.0 (6074)	1500.6 (2813)	1689 (2688)	11.8 (18.6)	0.35 (0.29)	0.19 (0.16)
Village collective construction	4	2563.4 (2544)	1893.8 (6074)	551.5 (884)	19.5 (22.9)	0.40 (0.24)	0.15 (0.14)
Public housing/units/collective dormitory/others	5.7	2649.0 (2375)	783 (562)	684.1 (1227)	27.2 (46.1)	0.43 (0.28)	0.13 (0.15)
p^*-Value of difference across categories		0.039	0.162	0.031	<0.001	0.002	0.043
Tenancy contract type							
Written contract	37.9	3608.7 (11,348)	1181.7 (2379)	1076.5 (3048)	16.2 (18.7)	0.44 (0.25)	0.22 (0.19)
Oral contract	44.1	2245.7 (2110)	743.4 (514)	813.8 (1446)	10.5 (29.3)	0.20 (0.19)	0.16 (0.15)
No contract	18	2264.3 (2001)	695.4 (465)	377.2 (837.6)	16.1 (21.9)	0.32 (0.23)	0.19 (0.20)
p-Value of difference across categories		0.011	<0.001	0.005	<0.001	<0.001	<0.001
Residential stability (duration of stay)							
0–2 years	35	3211.0 (11,120)	777.2 (505)	692.4 (1457)	14.4 (18.7)	0.31 (0.25)	0.18 (0.18)
3–5 years	31.2	2361.8 (1978)	954.4 (2396)	975.3 (2062)	12.3 (23.7)	0.28 (0.24)	0.17 (0.16)

6–10 years	21.8	2236.7 (2455)	878.3 (520)	725.7 (1850)	11.7 (31.3)	0.32 (0.24)	0.19 (0.21)
>10 years	12	2499.1 (2119)	984 (716)	986.9 (3920)	14.4 (18.6)	0.41 (0.28)	0.21 (0.18)
p*-Value of difference across categories		0.252	0.004	0.242	<0.001	0.001	0.513
Housing in hometown							
Yes	93.2	2816.2 (7346)	919 (1623)	853.4 (2213)	13.2 (20.8)	0.31 (0.25)	0.18 (0.18)
No	6.8	1899.3 (1466)	802 (617)	554.2 (1567)	20.3 (54.3)	0.32 (0.23)	0.23 (0.17)
p*-Value of difference across categories		0.006	0.267	0.290	0.077	0.725	0.008
Transition in property rights							
Likelihood of demolition							
Yes	85.7	2741 (7385)	919.8 (1517)	796.3 (2153)	12.7 (24.2)	0.31 (0.25)	0.19 (0.18)
No	14.3	2844.9 (5493)	880.3 (1906)	1011.1 (2326)	20 (26.5)	0.36 (0.23)	0.18 (0.19)
p*-Value of difference across categories		0.245	0.019	0.041	<0.001	0.013	0.154
Land acquisition							
No loss of land	88.8	2701 (7551)	839.8 (976)	841.3 (2184)	13.4 (25.8)	0.29 (0.24)	0.19 (0.18)
Partial or complete loss of arable land/homestead	11.2	2924.1 (3648)	1383.3 (3818.)	992.7 (2600)	15.4 (19.6)	0.38 (0.27)	0.21 (0.22)
p*-Value of difference across categories		0.926	0.004	0.796	0.027	0.003	0.800

*Non-parametric Kruskal–Wallis test was employed to ascertain the significance of the difference across categories of the predictor variables.

esidential stability; village tenants of 6–10 years and greater than 10 years of stay tend to spend significantly more on food than new and fairly recent tenants of 0–2 years ($\beta = 0.050$ and $\beta = 0.076$, respectively, $p < 0.05$). Compared to those who own houses in hometowns or villages, non-owners have significantly lower per-capita income ($\beta = -0.309$, $p < 0.05$). Among the indicators of degree of security of property rights, slightly lower household food expenditure is reported by tenants who do not anticipate demolition of their residences ($\beta = -0.072$, $p < 0.05$).

(b) *Associations of housing poverty indicators with entitlements*

Significant variability in the indicators of housing poverty across categories of entitlements was observed (Table 2). Both per-capita dwelling area and index of household amenities vary significantly across the three categories of household registration, city households being better off, and rural agricultural households being most deprived. Among the variables of social entitlements, mean per-capita dwelling area and index of household amenities vary significantly between holders and non-holders of old-age insurance, unemployment insurance, work injury insurance, and other social insurance. The mean housing expenditure ratio is significantly different in categories of old-age insurance and medical insurance. All three indicators of housing poverty differ significantly across employment contract type, being lowest among those having permanent/long-term and highest among the holders of temporary contract. Housing expenditure ratio is significantly higher for self-employed and business owners compared to the employed. Of the housing poverty indicators, only per-capita dwelling area varies significantly among categories of employment stability. Contrary to expectation, holders of very unstable jobs have the highest mean dwelling space. Significant differences in all three housing poverty indicators are found with respect to tenancy tenure type, with the category of public housing/units/collective dormitory/others being associated with maximum dwelling space, amenities, and minimum housing expenditure ratio. Similarly, significant differences are observed across categories of tenancy contract type, with holders of permanent contracts being associated with better quality housing than those having oral contracts and no contracts. Both per-capita dwelling area and index of household amenities vary significantly across categories of residential stability, both being significantly higher for respondents with a longer duration of stay. Residents with landed property in their hometown or village have higher housing expenditure ratios, higher per capita income, and lower living space compared to those without. Compared to residents predicting demolition of their neighborhoods, those who consider their neighborhood to be more secure have significantly higher mean per-capita dwelling area and index of household amenities. Residents who have partially or completely lost arable land/homestead to land acquisition have significantly better household amenities and more space than those who have not.

Table 4 presents the results of a robust regression of the three housing poverty measures and property rights indicators for the whole sample. Controlling for household profiles and property rights/entitlement bundles and with Beijing as the reference category, survey participants residing in Shanghai had significantly lower dwelling area, household amenities, and housing expenditure ratio ($\beta = -0.214$, $\beta = -0.110$, and $\beta = -0.040$ respectively, $p < 0.05$), while those residing in Guangzhou had higher dwelling area and household amenities ($\beta = 0.382$, and $\beta = 0.280$ respectively, $p < 0.05$). Compared to rural-agricultural *hukou* households, urban-hukou households generally had lower housing poverty, while rural

Table 3. *Results of the robust regression indicating the degrees of association between income, food consumption, savings, and property rights/entitlements*

Predictors	Log (per-capita income)		Log (food-expenses)		Log (savings)	
	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.
Constant	8.322** (0.142)	8.044, 8.601	1.565** (0.133)	1.304, 1.826	−0.695** (0.260)	−1.208, −0.182
City						
Beijing (ref)						
Shanghai	0.164** (0.060)	0.046, 0.282	−0.061** (0.025)	−0.110, −0.011	0.281** (0.058)	0.166, 0.395
Guangzhou	0.039 (0.059)	−0.078, 0.155	0.017 (0.023)	−0.029, 0.063	0.085 (0.054)	−0.021, 0.191
Household profile						
Gender (Female *vs.* Male)	−0.076 (0.063)	−0.200, 0.048	−0.078** (0.027)	−0.130, −0.026	−0.030 (0.052)	−0.131, 0.072
Number of dependants	−0.242** (0.019)	−0.279, −0.204	0.100** (0.008)	0.083, 0.116	0.195** (0.017)	0.161, 0.228
Educational attainment						
Junior high school (ref)						
None/primary school	−0.072 (0.064)	−0.197, 0.053	0.018 (0.026)	−0.032, 0.069	−0.016 (0.050)	−0.114, 0.083
Senior middle school	0.123** (0.053)	0.019, 0.227	0.008 (0.022)	−0.036, 0.052	0.011 (0.040)	−0.068, 0.089
Technical secondary school	0.110 (0.093)	−0.072, 0.293	0.054 (0.039)	−0.023, 0.130	0.132* (0.076)	−0.019, 0.283
College/undergraduate/postgraduate	0.321** (0.089)	0.147, 0.495	0.035 (0.037)	−0.038, 0.109	0.010 (0.074)	−0.136, 0.157
Index of social capital	−0.289 (0.186)	−0.654, 0.076	−0.142* (0.075)	−0.290, 0.005	−0.056 (0.144)	−0.341, 0.229
Log-income			0.157** (0.014)	0.129, 0.185	0.447** (0.027)	0.393, 0.500
Residence registration						
Rural agricultural household (ref)						
City household	−0.120 (0.121)	−0.357, 0.117	−0.007 (0.049)	−0.102, 0.089	0.017 (0.115)	−0.210, 0.245
Rural non-agricultural household	0.137** (0.061)	0.016, 0.257	−0.026 (0.026)	−0.077, 0.024	−0.004 (0.046)	−0.096, 0.087
Property right/entitlement bundle – Social security						
Old-age insurance	−0.135* (0.07)	−0.272, 0.003	−0.032 (0.029)	−0.089, 0.024	0.062 (0.056)	−0.049, 0.173
Medical insurance	0.150** (0.056)	0.040, 0.260	0.028 (0.022)	−0.015, 0.071	−0.096** (0.041)	−0.176, −0.015
Unemployment insurance	0.143 (0.118)	−0.089, 0.376	−0.063 (0.049)	−0.160, 0.033	−0.144* (0.083)	−0.308, 0.020
Work injury insurance	−0.035 (0.080)	−0.192, 0.121	−0.024 (0.036)	−0.095, 0.046	0.104 (0.067)	−0.028, 0.236
Other social insurance	0.096 (0.093)	−0.087, 0.279	0.077** (0.037)	0.005, 0.149	0.105 (0.073)	−0.039, 0.249
Property right/entitlement bundle – Employment						
Labor contract type						
Self-employed & business owner (ref)						
Permanent & long-term ($\geqslant$3 years)	0.089 (0.098)	−0.104, 0.282	0.037 (0.042)	−0.046, 0.12	−0.012 (0.072)	−0.153, 0.130
Short-term (0–3 years)	−0.124** (0.062)	−0.245, −0.003	0.023 (0.025)	−0.026, 0.072	−0.084* (0.046)	−0.175, 0.007
Temporary (No contract)	−0.127** (0.058)	−0.241, −0.013	0.036 (0.023)	−0.01, 0.082	−0.061 (0.045)	−0.150, 0.028
Others	−0.186** (0.085)	−0.354, −0.018	−0.011 (0.034)	−0.079, 0.057	0.022 (0.061)	−0.098, 0.142
Employment stability						
Highly stable (No change) – ref						
Moderately stable (1 change)	−0.066 (0.055)	−0.173, 0.041	−0.015 (0.023)	−0.060, 0.030	−0.088** (0.042)	−0.170, −0.006
Unstable (1 $<$ changes $\leqslant$ 3)	−0.151* (0.087)	−0.321, 0.019	0.026 (0.037)	−0.047, 0.098	−0.016 (0.072)	−0.157, 0.125
Very unstable (>3 changes)	−0.017 (0.091)	−0.196, 0.162	0.01 (0.036)	−0.061, 0.082	−0.211** (0.068)	−0.345, −0.078
Property right/entitlement bundle – Housing						
Tenancy tenure type						
Villages' self-built units (ref)						
Urban residential private units	−0.009 (0.070)	−0.147, 0.129	−0.002 (0.039)	−0.079, 0.074	0.205** (0.061)	0.085, 0.325
Village collective construction	0.174 (0.139)	−0.099, 0.447	−0.009 (0.053)	−0.113, 0.096	−0.240** (0.100)	−0.438, −0.042
Public housing/ units/ collective dormitory/others	−0.032 (0.102)	−0.232, 0.168	0.033 (0.040)	−0.046, 0.111	−0.015 (0.076)	−0.165, 0.136

Tenancy contract type						
Written contract (ref)						
Oral contract	−0.113** (0.052)	−0.215, −0.01	−0.037* (0.021)	−0.079, 0.005	−0.003 (0.047)	−0.096, 0.090
No contract	−0.154** (0.067)	−0.286, −0.023	−0.060** (0.027)	−0.113, −0.008	0.175** (0.064)	0.050, 0.301
Residential stability (duration of stay)						
0–2 years (ref)						
3–5 years	−0.028 (0.054)	−0.134, 0.079	0.002 (0.022)	−0.042, 0.046	0.028 (0.038)	−0.047, 0.103
6–10 years	−0.010 (0.061)	−0.129, 0.110	0.050** (0.025)	0.001, 0.099	−0.008 (0.046)	−0.100, 0.083
>10 years	−0.046 (0.074)	−0.192, 0.100	0.076** (0.03)	0.017, 0.135	−0.058 (0.063)	−0.182, 0.066
Housing in hometown						
Yes (ref)						
No	−0.309** (0.085)	−0.477, −0.141	−0.035 (0.034)	−0.101, 0.032	0.012 (0.068)	−0.122, 0.146
Transition in property rights						
Propensity to residential conversion						
Yes (ref)						
No	−0.078 (0.064)	−0.203, 0.048	−0.072** (0.025)	−0.121, −0.022	−0.029 (0.041)	−0.110, 0.052
Land acquisition						
No loss of land (ref)						
Partial or complete loss of arable land/homestead	0.078 (0.068)	−0.055, 0.211	−0.001 (0.026)	−0.053, 0.051	−0.026 (0.049)	−0.123, 0.072

Results of robust regression in Stata 11.2 are expressed as beta (standard error), 95% confidence interval.
* $p < 0.10$.
** $p < 0.05$.

non-agricultural hukou households were worse off. However, the differences were not significant. All three indicators of housing poverty vary significantly with per-capita income as expected. Per-capita dwelling area and index of household amenities are positively associated with per-capita income ($\beta = 0.101$ and $\beta = 0.065$ respectively, $p < 0.05$), while housing expenditure ratio has a negative association ($\beta = -0.088$, $p < 0.05$). Educational attainment is negatively associated with housing poverty, an expected human capital housing market effect: with reference to those attending junior high school, those with senior middle school education have higher per-capita dwelling area and household amenities ($\beta = 0.058$, $p < 0.50$ and $\beta = 0.039$, $p < 0.10$, respectively). Similarly, the index of household amenities is significantly higher among residents with technical secondary school degrees ($\beta = 0.077$, $p < 0.05$) as well as college/undergraduate/postgraduate degrees ($\beta = 0.069$, $p < 0.05$). Considering indicators of social entitlements, respondents with old age insurance have comparatively lower household amenities index ($\beta = -0.040$, $p < 0.05$). Those with old-age insurance and any other social insurance had higher household amenities ($\beta = 0.038$ and $\beta = 0.048$, $p < 0.10$).

With respect to labor contract type, respondents with temporary labor contracts are significantly poorer both in terms of per-capita dwelling space and household amenities ($\beta = -0.041$, $p < 0.10$ and $\beta = -0.037$, $p < 0.05$, respectively), compared with self employed and business owners. Also, compared to self employed and business owners, all other categories of labor contract exhibit a significant negative association with household expenditure ratio ($\beta = -0.074$ for permanent and long-term employed, $\beta = -0.067$ for short-term contract and $\beta = -0.091$ for temporary contract): households headed by workers on wage contracts spend less on housing, controlling for income, than those self employed; the more so the more insecure the wage contract. Compared to holders of highly stable employment, those with moderately stable job history report significantly higher per-capita housing expenditure ratio ($\beta = 0.027$, $p < 0.05$).

The general trends in our models indicate that public welfare housing is synonymous with lower degrees of housing poverty, while private housing is associated with higher housing poverty. Compared to those living in villagers' self-built units, living in a private housing unit (*sifang*) belonging to urban residents is associated with lower per-capita dwelling area ($\beta = -0.111$, $p < 0.05$). In short, living in the housing of urban landlords means smaller living space because the house is more valuable (because it could be transacted in the urban housing market in contrast to rural housing, which cannot be sold directly in the urban housing market). Renters in the public housing/units/collective dormitory/others category have significantly lower housing expenditure ratio ($\beta = -0.068$, $p < 0.05$). As with our income-poverty indicators, tenancy contract type remains a significant predictor for all three indicators of housing poverty. Compared to residents with written contracts, those with oral contracts have significantly lower per-capita dwelling area, lower index of household amenities, and lower housing expenditure ratio ($\beta = -0.047$, $\beta = -0.078$, and $\beta = -0.049$ respectively, $p < 0.05$). Residents with no tenancy contract have significantly lower housing expenditure ratio ($\beta = -0.040$, $p < 0.05$) implying comparatively lesser amounts expended in housing utilities and maintenance.

Among the indicators of locational security, compared to tenants who anticipate demolition, those who do not, have significantly lower household amenities ($\beta = -0.035$, $p < 0.10$) and lower housing expenditure ratio ($\beta = -0.037$, $p < 0.05$).

6. DISCUSSION

These results present a fine-grained picture of the associations between six dimensions of poverty and four dimensions of property rights and informality in China's informal settlements. The advantage of this methodology is that the picture can be read and interpreted at various levels of detail, for example, with a focus on poverty-informality; poverty-property rights; or particular kinds of poverty, informality, and property rights (or entitlements, if preferred). By defining informality in terms of property rights, we are able to dissect its constituent meanings systematically. Since the relationships uncovered in Tables 2–4 are too many to discuss in terms of these many possible perspectives, we leave readers to develop their own particular interpretations. In this section, however, we sample the kind of analysis, particularly theory-building, that our work permits; drawing out some general patterns discovered, using the distinctions made in Section 3 between Sen and de Soto effects and PRE categories (property rights effects).

Starting with the associations between property rights and *income, food, and savings poverty indicators*, the higher per capita income of rural non-agricultural *hukou* households compared to rural agricultural *hukou* holder is probably a PRE1 (human capital) effect. Such migrants are more urban-savvy and entrepreneurial than otherwise similar rural *hukou* holders. The greater per-capita income associated with higher educational attainment is another PRE1 (human capital effect). The higher per-capita income associated with medical insurance; higher food expenditure associated with 'other social insurance are also probably PRE1 (human capital) effects. People with higher human capital endowments can negotiate better paid jobs that endow additional employment-related rights.

The inverse relationship between per capita income and old-age insurance, and between household savings and medical and unemployment insurance suggest that insurance premiums might be a substitute for savings and food expenditure. Either insurance reduces the need to save or insurance premiums reduce the capacity to save. By the same account, the results are consistent with the idea that people forgo current income and savings to secure future investments. This is a PRE2 effect: securing a right to a minimum standard of future income and current health-care via the insurance market increases poverty on another dimension.

The lower income of short-term and temporary labor contract types compared to comparable self-employed and business owners could indicate PRE4, 6, 7, and 8 effects as well as more nuanced PRE1 (human capital) effects: shorter term labor contracts inhibit personal investment in a job and limit access to collateral economic and financial benefits. The same may be said of the decreasing trend in income when moving down the employment contract security categories; the lower savings of those with short-term labor contracts; and the lower incomes of those with more unstable jobs. All may point to a set of *de Soto effects*.

The higher savings of households in urban residential private units (small property rights semi-legal ownership) compared to tenants of villager owned units, controlling for income, shows the diversification of the informal housing markets in urban villages. These units are purchased from villagers illegally and occupied by urban *hukou* holders or better-off migrants. This may also be a PRE1 (human capital effect), with urban *hukou* holders having more chance to accumulate savings; but it is also a PRE3 effect, with households willing to trade off lower housing costs for less secure ownership rights.

The lower income and food expenditure of those with an oral tenancy contract or without any contract on their home seems likely to be a PRE1 (human capital) effect, unless it implies that landlords of this kind of tenancy exploit low-income tenants with higher rents, thus reducing food expenditure compared to comparable households with more secure accommodation contracts. In which case, this is another kind of PRE1 effect: lack of clear rights leads to exploitative rental prices. The fact that those with oral tenancy contracts have higher household savings may be consistent with the idea that people with less secure accommodation feel the need to save more. This is a kind of PRE3 effect, with a trade-off being made between lower tenure security and higher savings.

The higher food expenditure of those who have lived longer in urban villages is likely to be partly PRE5-7 effects, with longer established households being willing to spend more on food consumption because of higher neighborhood social, economic, and financial capital (particularly social capital).

The lower income of those not owning houses elsewhere (a minority of the sample) is consistent with both collateral and investment versions of de Soto property rights effects (PRE4). However, we do not know the extent to which village and hometown homes are used as collateral (informally or formally). To the extent that households in our survey included income from the first homes in their disclosed income totals, this is a first-order PRE1 effect: higher income arising from landed property ownership.

Moving to *housing poverty indicators*, higher housing expenditure ratios for rural non-agricultural *hukou*-holders compared to rural agricultural households implies that town/city-to-city migrants reside in informal dwellings that have poorly invested in household utilities and maintenance. This may well reflect the particular location choices they make as urban entrepreneurs. This is a PRE1 (human capital) effect. The higher housing poverty among lower education households is also a PRE1 (human capital) effect.

The poorer amenities among respondents with medical insurance could reflect a substitution effect between housing and social security consumption. The positive relationships between amenities and old-age and other social insurance, probably reflect non-income-related employment and locational benefits.

The poorer space and amenity standards for those with temporary labor contracts highlights the positive influences of employment-based entitlements toward reducing housing poverty after statistical adjustment for income; respondents at the same income level but less secure employment contract are poorer in terms of per-capita dwelling area and household amenities. This could be partially a PRE1 effect but it may also be a classic example of a de Soto effect (PRE4–7). The same may be said of the finding that households headed by workers on wage contracts spend less on housing, controlling for income, than those self employed; the more insecure the wage contract, the less the housing expenditure ratio.

The better housing conditions (housing expenditure ratio) associated with moderately stable compared to highly stable employment histories is a puzzle, but may indirectly point to subtle human capital effects (PRE1); in an unstable labor market those better off in terms of human capital have a greater propensity to take risks by moving jobs in search of better value in terms of housing conditions.

The lower space standards of those living in private 'small property rights' housing reflect the nature of these constructions: modern, commodity housing with relatively good amenities but relatively expensive and located in high density neighborhoods. There is a PRE3 effect here: lower space

Table 4. *Results of the robust regression indicating the degrees of association between housing informality and property rights/entitlements*

Predictors	Log(per-capita dwelling area)		Index of household amenities		Housing expenditure ratio	
	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.
Constant	0.230* (0.139)	−0.043, 0.503	−0.297** (0.094)	−0.482, −0.112	1.000** (0.071)	0.861, 1.139
City						
Beijing (ref)						
Shanghai	−0.214** (0.025)	−0.264, −0.165	−0.110** (0.017)	−0.144, −0.077	−0.040** (0.013)	−0.065, −0.014
Guangzhou	0.382** (0.025)	0.333, 0.431	0.280** (0.017)	0.247, 0.314	0.003 (0.013)	−0.022, 0.028
Household profile						
Gender (Female *vs.* Male)	−0.030 (0.027)	−0.083, 0.022	−0.012 (0.018)	−0.047, 0.023	−0.045** (0.014)	−0.071, −0.018
Number of dependants	−0.102** (0.009)	−0.119, −0.085	0.026** (0.006)	0.014, 0.038	−0.028** (0.005)	−0.036, −0.019
Educational attainment						
Junior high school (ref)						
None/primary school	0.029 (0.027)	−0.024, 0.081	<0.001 (0.018)	−0.035, 0.036	0.012 (0.014)	−0.015, 0.039
Senior middle school	0.058** (0.022)	0.015, 0.102	0.039* (0.015)	0.009, 0.068	<0.001 (0.012)	−0.023, 0.022
Technical secondary school	0.041 (0.039)	−0.035, 0.117	0.077** (0.026)	0.026, 0.129	0.033 (0.021)	−0.008, 0.073
College/undergraduate/postgraduate	0.060 (0.038)	−0.014, 0.134	0.069** (0.025)	0.020, 0.119	−0.004 (0.020)	−0.043, 0.036
Index of social capital	0.222** (0.078)	0.070, 0.375	0.059 (0.053)	−0.045, 0.162	−0.015 (0.040)	−0.094, 0.063
Log-income	0.101** (0.015)	0.071, 0.13	0.065** (0.010)	0.045, 0.085	−0.088** (0.008)	−0.103, −0.074
Residence registration						
Rural agricultural household (ref)						
City household	0.033 (0.051)	−0.068, 0.134	0.034 (0.034)	−0.033, 0.102	0.012 (0.026)	−0.04, 0.063
Rural non-agricultural household	−0.008 (0.026)	−0.058, 0.043	−0.024 (0.017)	−0.059, 0.010	0.027* (0.014)	0.000, 0.053
Property right/entitlement bundle – Social security						
Old-age insurance	−0.020 (0.029)	−0.077, 0.038	0.038* (0.02)	−0.001, 0.077	−0.001 (0.015)	−0.031, 0.028
Medical insurance	−0.018 (0.023)	−0.064, 0.028	−0.040** (0.016)	−0.072, −0.009	−0.012 (0.012)	−0.035, 0.011
Unemployment Insurance	0.016 (0.05)	−0.082, 0.115	0.011 (0.033)	−0.055, 0.077	−0.014 (0.027)	−0.066, 0.038
Work injury insurance	0.006 (0.033)	−0.06, 0.071	−0.021 (0.023)	−0.065, 0.024	0.008 (0.019)	−0.030, 0.046
Other social insurance	0.042 (0.039)	−0.034, 0.118	0.048* (0.026)	−0.003, 0.100	0.005 (0.02)	−0.034, 0.044
Property right/entitlement bundle – Employment						
Labor contract type						
Self-employed & business owner (ref)						
Permanent & long-term (⩾3 years)	−0.019 (0.041)	−0.099, 0.062	0.028 (0.028)	−0.027, 0.082	−0.074** (0.022)	−0.118, −0.031
Short-term (0–3 years)	−0.013 (0.026)	−0.063, 0.038	0.007 (0.017)	−0.027, 0.041	−0.067** (0.013)	−0.093, −0.04
Temporary (No contract)	−0.041* (0.024)	−0.088, 0.007	−0.037** (0.016)	−0.069, −0.004	−0.091** (0.012)	−0.115, −0.067
Others	0.033 (0.036)	−0.038, 0.103	0.046* (0.024)	−0.001, 0.094	−0.029 (0.018)	−0.064, 0.007
Employment stability						
Highly stable (No change) - ref						
Moderately stable (1 change)	0.028 (0.023)	−0.017, 0.073	−0.008 (0.015)	−0.038, 0.022	0.027** (0.012)	0.003, 0.051
Unstable (1 < changes ⩽ 3)	−0.051 (0.036)	−0.122, 0.020	<0.001 (0.024)	−0.048, 0.048	0.019 (0.02)	−0.020, 0.057
Very unstable (>3 changes)	0.049 (0.038)	−0.026, 0.124	−0.033 (0.026)	−0.083, 0.018	−0.025 (0.019)	−0.063, 0.013
Property right/entitlement bundle – Housing						
Tenancy tenure type						
Villages' self-built units (ref)						
Urban residential private units	−0.111** (0.029)	−0.169, −0.054	−0.017 (0.02)	−0.056, 0.022	0.026 (0.021)	−0.016, 0.067
Village collective construction	0.016 (0.058)	−0.098, 0.130	−0.020 (0.039)	−0.097, 0.057	−0.03 (0.029)	−0.088, 0.028

(*continued on next page*)

Table 4. (*continued*)

Predictors	Log(per-capita dwelling area)		Index of household amenities		Housing expenditure ratio	
	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.	Beta (S.E.)	95% C.I.
Public housing/ units/ collective dormitory/others	0.031 (0.043)	−0.053, 0.116	0.022 (0.029)	−0.035, 0.079	−0.068** (0.022)	−0.11, −0.025
Tenancy contract type						
Written contract (ref)						
Oral contract	−0.047** (0.022)	−0.09, −0.004	−0.078** (0.015)	−0.107, −0.049	−0.049** (0.011)	−0.071, −0.027
No contract	−0.022 (0.028)	−0.078, 0.033	−0.031 (0.019)	−0.068, 0.007	−0.040** (0.014)	−0.068, −0.012
Residential stability (duration of stay)						
0–2 years (ref)						
3–5 years	−0.032 (0.023)	−0.077, 0.013	−0.020 (0.015)	−0.050, 0.010	−0.003 (0.012)	−0.027, 0.020
6–10 years	−0.035 (0.025)	−0.085, 0.015	−0.001 (0.017)	−0.034, 0.033	−0.013 (0.013)	−0.039, 0.013
>10 years	−0.043 (0.031)	−0.104, 0.019	0.019 (0.021)	−0.022, 0.061	0.011 (0.016)	−0.021, 0.042
Housing in hometown						
Yes (ref)						
No	0.012 (0.036)	−0.058, 0.083	−0.003 (0.024)	−0.051, 0.045	0.029 (0.018)	−0.007, 0.065
Transition in property rights						
Propensity to residential conversion						
Yes (ref)						
No	−0.013 (0.027)	−0.066, 0.039	−0.035* (0.018)	−0.070, 0.001	−0.037** (0.014)	−0.064, −0.010
Land acquisition						
No loss of land (ref)						
Partial or complete loss of arable land/homestead	0.004 (0.028)	−0.052, 0.06	−0.001 (0.019)	−0.039, 0.036	0.021 (0.014)	−0.007, 0.050

Result of robust regression in Stata 11.2 are expressed as beta (standard error), 95% confidence interval.
* $p < 0.10$.
** $p < 0.05$.

standards and lower property rights security being accepted for home prices that are relatively cheap compared to outside the urban village (but still relatively expensive compared to inside). Similarly, the lower housing expenditure ratio in village collective construction units compared to self-built villager units reflect trade-offs between rights, space, quality, amenities, and so on, all having various PRE3 substitution effects in respect of property rights and housing poverty. This also points to a diversification in urban village housing market.

The higher housing poverty among those with oral or no accommodation contracts shows that controlling for income, weaker land (housing) rights are associated with poorer space standards, poorer amenities, and lower levels of income being spent on housing. This is a classic informal settlement research finding (although few studies manage to control for income). In the face of high demand for low rental accommodation, landlords supply low quality housing under informal conditions and weaker property rights. This is partly a PRE3 effect and partly a PRE1 (human capital) effect and ties in with the finding that those with weak or no accommodation contract have lower income and lower food expenditure. We note however, that there could be a de Soto effect going on here, if weak housing rights inhibit income-earning ability.

The higher housing poverty among those expecting their neighborhood to be demolished probably reflects the fact that poorer quality living environments are more vulnerable to conversion under village redevelopment programs. The higher space, amenities, and housing expenditure ratio of those who have had land expropriated are likely to be attributable to the additional entitlements gained in the form of monetary and property compensation or dividends from shares in village collective companies. This is a PRE1 effect that is somewhat counter-intuitive to common perceptions of the land-dispossessed Chinese peasant (Zhao & Webster, 2011). It is evidenced that the stories of peasants imprudently gambling away their compensation packages, or dumped without resources in the city, are not the full picture. Our data suggest that transfer endowments via government-organized compensation place them in a better position with respect to urban housing poverty than equivalent households who have not been dispossessed of land.

We do not have space to elaborate an analysis of PRE 9 and 10 effects, but can summarize an important point. The property rights effects on poverty implied in the forgoing discussing provide a fine-scale and complex example of both the Ostrom and Coase PRE effects defined in Section 3. Ostrom effects, because what we see in our models is an outworking of various communally created values (externality costs and benefits) being traded off with household private budgets, in part facilitated by collectively organized and governed rules. Urban villages started off life as urban spaces under relatively unitary collective ownership. What happens to ownership thereafter, can in part, be viewed as a success of the commons. Our findings illustrate Coasian effects because, following the same line of reasoning, the multiplication and fragmentation of rights over multiple urban village resources and householders' responses to them, is evidence of the evolution of property rights in search of less costly resource allocation.

7. CONCLUSION

Based on a representative sample of urban villages in China's three principal cities, we have attempted to analyze in a high degree of detail, the links between property rights (entitlements), informality, and poverty. By operationally defining informality in terms of an explicit profile of property rights and by drawing on well-founded formal theories of the latter, we present what we regard as the most disaggregated study yet of these issues in the context of China's informal settlements. Our principal aim has been to identify statistically significant associations between poverty indicators on the one hand, and the presence/absence and degree of property rights on the other. We have done this over six poverty domains and four property rights domains. A second aim has been to interpret these associations using selected key themes in the property rights literature. We find evidence of both Sen effects and de Soto effects at work in China's "favelas".

An important insight from our study is that the absence of a property right in an informal settlement potentially has both negative and positive effects. It can reduce overall welfare because it means that access to a resource is insecure or non-existent. On the other hand, because of substitution effects within the household budget, it can raise a household's entitlement mapping and reduce poverty on some other dimension of welfare. Such property rights effects in informal settlements may be both imposed and voluntary. The segmentation of informal housing markets within urban villages can be viewed as a diversification of property rights over land and housing, with consumers and suppliers engaging in an economic dance that results in a portfolio of options. Each trade's gains and losses associated with different housing attributes with other household budget items. Village residents choose to consume certain resources with less or with more degrees of rights, protection, and security. For example, they choose to purchase retirement income security rights from the insurance market and to forego living space per capita or food consumption per capita.

On the other hand, ownership of certain property rights may be coerced by a government. Through building regulations, people may be coerced to consume a minimum standard of accommodation. Through health and safety legislation, they are forced to consume a minimum standard of workplace risk. The economic and social vibrancy of informal settlements comes in large part from the limited amount of coercive consumption. There are risks associated with this, and that is why Chinese city officials are in the process of demolishing many of their urban villages. But ambiguities and gaps in property rights turn informal settlements like *chengzhongcun* into low transaction-cost incubator spaces in their host cities. This is often stated as an ideological position; or noted in relation to the benefits of self-employment or to the contribution of informal industry to value-added in formal sector industrial supply chains or to the necessity of low cost informal services. We have added to this a household-focused story, showing just how complex and important for survival and advancement are the trade-offs between rights, uncertainty, costs, and benefits made in every dimension of the household economy. In so doing, we present a finely grained and empirically calibrated dissection of the notion of informality as it operates in China's rapidly disappearing "favelas".

Our findings have relevance beyond China. Although the complicated mix of institutions in chengzhongcun is peculiar to China's transitional period, we note that the institutions governing informal settlements in all countries tend to diversify over time. This renders the simplified descriptions, categories, and analysis appropriate for the initial phase of an informal settlement less so after twenty or 30 years. Our theoretical and empirical frameworks can help policy makers

understand how neighborhoods that started informally change over time with respect to different dimensions of informality. This can help target anti-poverty interventions. It might even save some communities from the bulldozer by providing evidence of effective self-organization over time. In Brasilia, squatter communities have started to demand not just property rights over individual housing plots but condominium-style collective property rights over shared urban space and facilities. In Istanbul, vast areas of what were once squatter neighborhoods are about to be reorganized by Turkey's version of a Land Readjustment law. Throughout China, experiments are underway to reorganize combined bundles of land rights and other urban entitlements. Urban village committees transformed into joint stock companies, for example, have the power to negotiate with private capitalists and developers over the distribution of rights under partnership redevelopment schemes. An urban village may, for example, negotiate the packaging up of its collective land into a mixed-use development of high-end commerce, low-income migrant housing, village-owned middle-income condominiums, schools, industries, and worker dormitories, yielding capital from which it can provide social security benefits to its elderly people as well as paying dividends to the villages who own the company (Webster, Wu, & Zhao, 2006, chap. 11). Understanding the substitution effects between different kinds of urban rights in household decision-making provides an evidence base for creative institutional design in this kind of negotiated urban redevelopment project.

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